History and Current Status of SZ-South Remedy

DTSC's Sacramento office

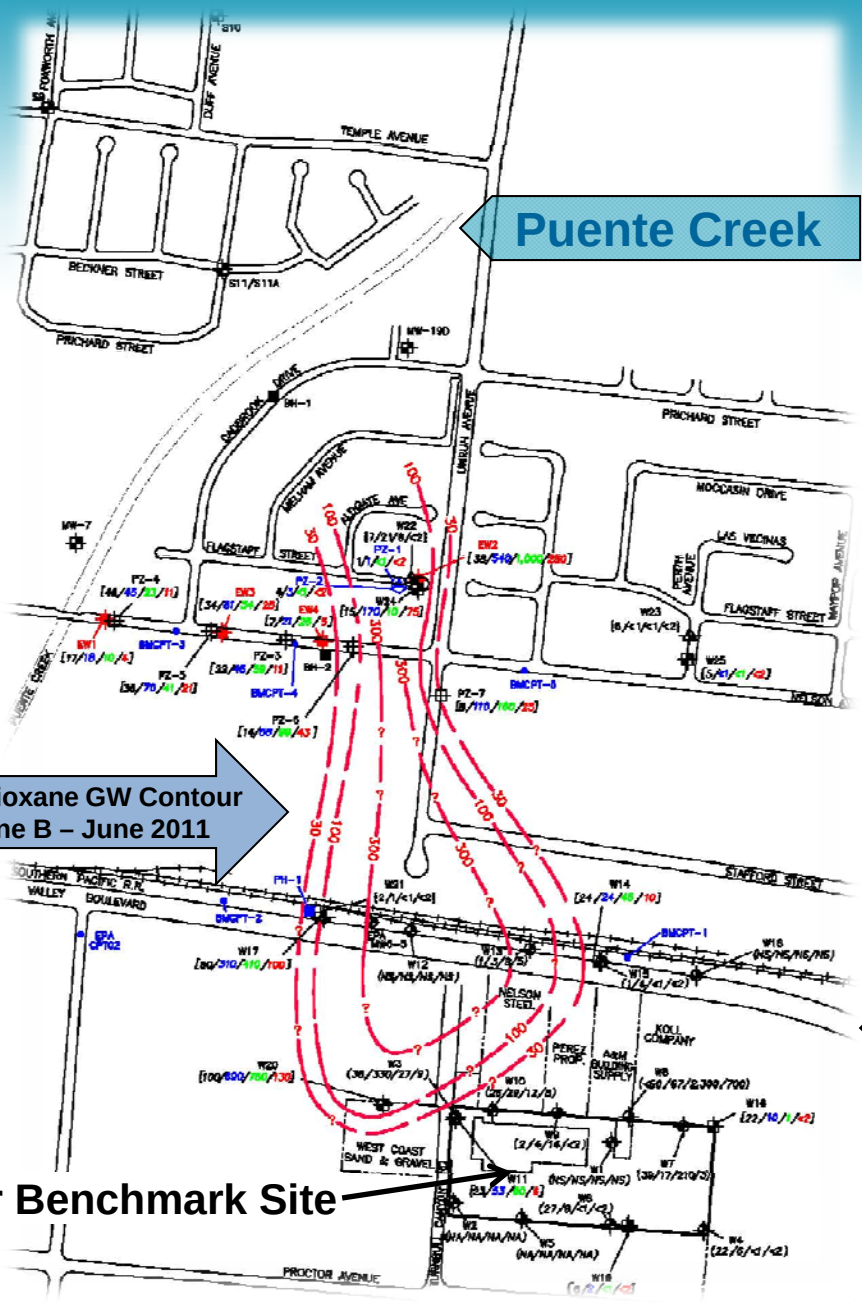
8 December 2011

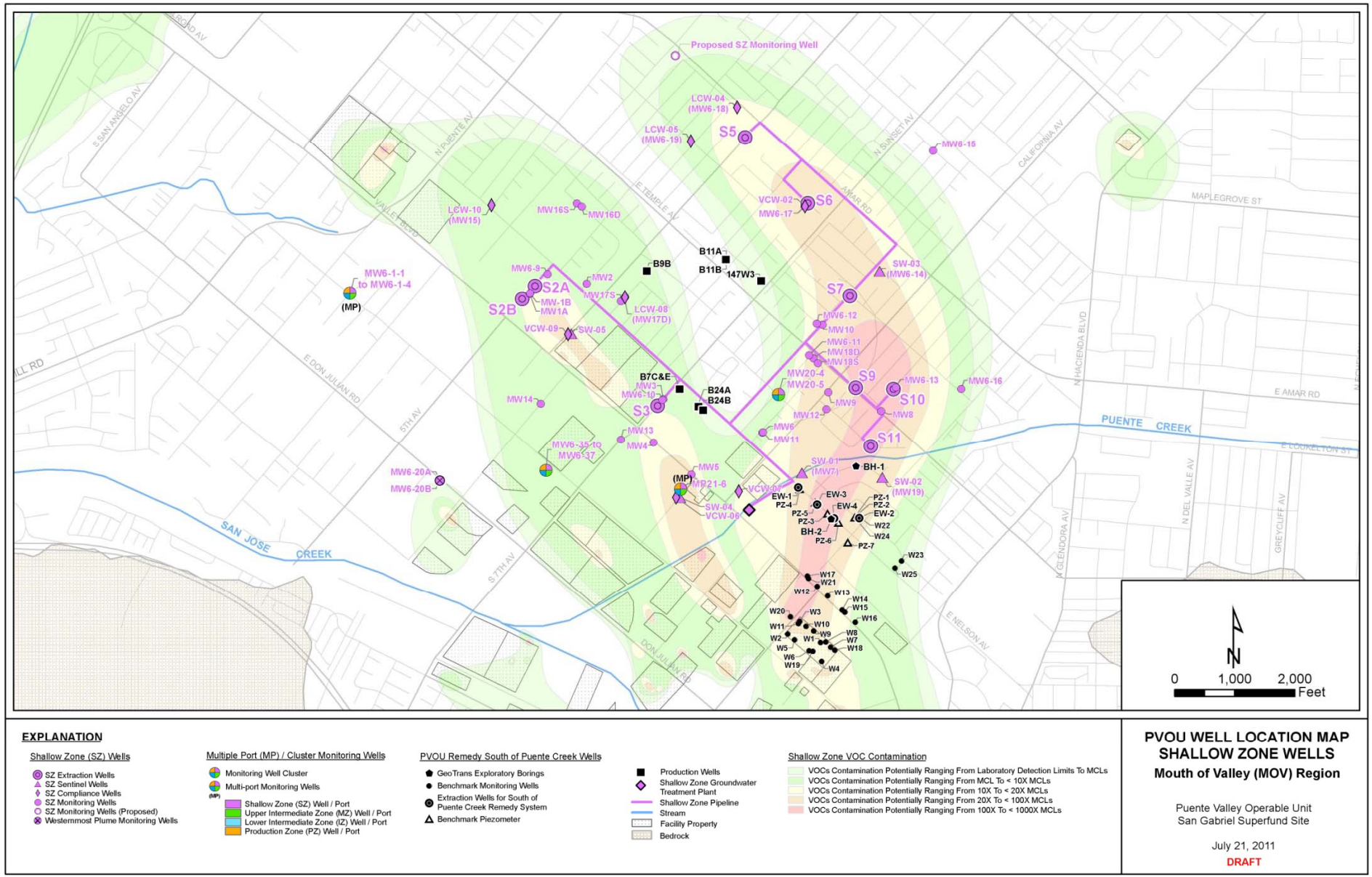
Remedial Objectives

Remediate groundwater attributable to the Benchmark source areas:

- Impacted by volatile organic compounds (VOCs) and 1,4-dioxane
- Present within the Shallow Zone (SZ)
- Located between the former Benchmark site and Puente Creek

SZ-South Remedy Location





EXPLANATION

Shallow Zone (SZ) Wells
- SZ Extraction Wells
- SZ Sentinel Wells
- SZ Compliance Wells
- SZ Monitoring Wells
- SZ Monitoring Wells (Proposed)
- Westernmost Plume Monitoring Wells

Multiple Port (MP) / Cluster Monitoring Wells
- Monitoring Well Cluster
- Multi-port Monitoring Wells (MP)
- Shallow Zone (SZ) Well / Port
- Upper Intermediate Zone (MZ) Well / Port
- Lower Intermediate Zone (IZ) Well / Port
- Production Zone (PZ) Well / Port

PVOU Remedy South of Puente Creek Wells
- GeoTrans Exploratory Borings
- Benchmark Monitoring Wells
- Extraction Wells for South of Puente Creek Remedy System
- Benchmark Piezometer

- Production Wells
- Shallow Zone Groundwater Treatment Plant
- Shallow Zone Pipeline
- Stream
- Facility Property
- Bedrock

Shallow Zone VOC Contamination
- VOCs Contamination Potentially Ranging From Laboratory Detection Limits To MCLs
- VOCs Contamination Potentially Ranging From MCL To < 10X MCLs
- VOCs Contamination Potentially Ranging From 10X To < 20X MCLs
- VOCs Contamination Potentially Ranging From 20X To < 100X MCLs
- VOCs Contamination Potentially Ranging From 100X To < 1000X MCLs

PVOU WELL LOCATION MAP
SHALLOW ZONE WELLS
Mouth of Valley (MOV) Region

Puente Valley Operable Unit
San Gabriel Superfund Site

July 21, 2011

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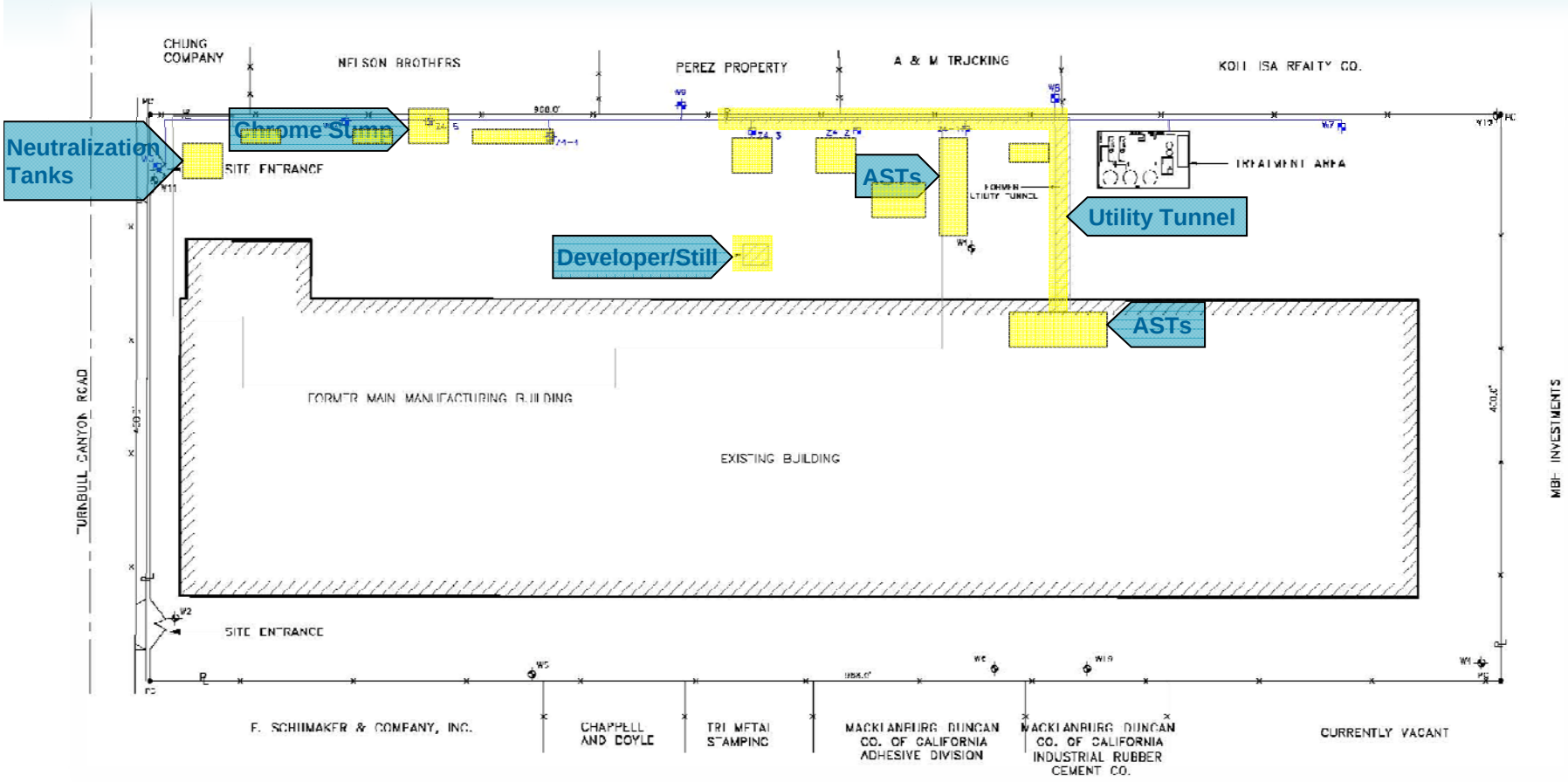
Site Plan and Former Source Areas

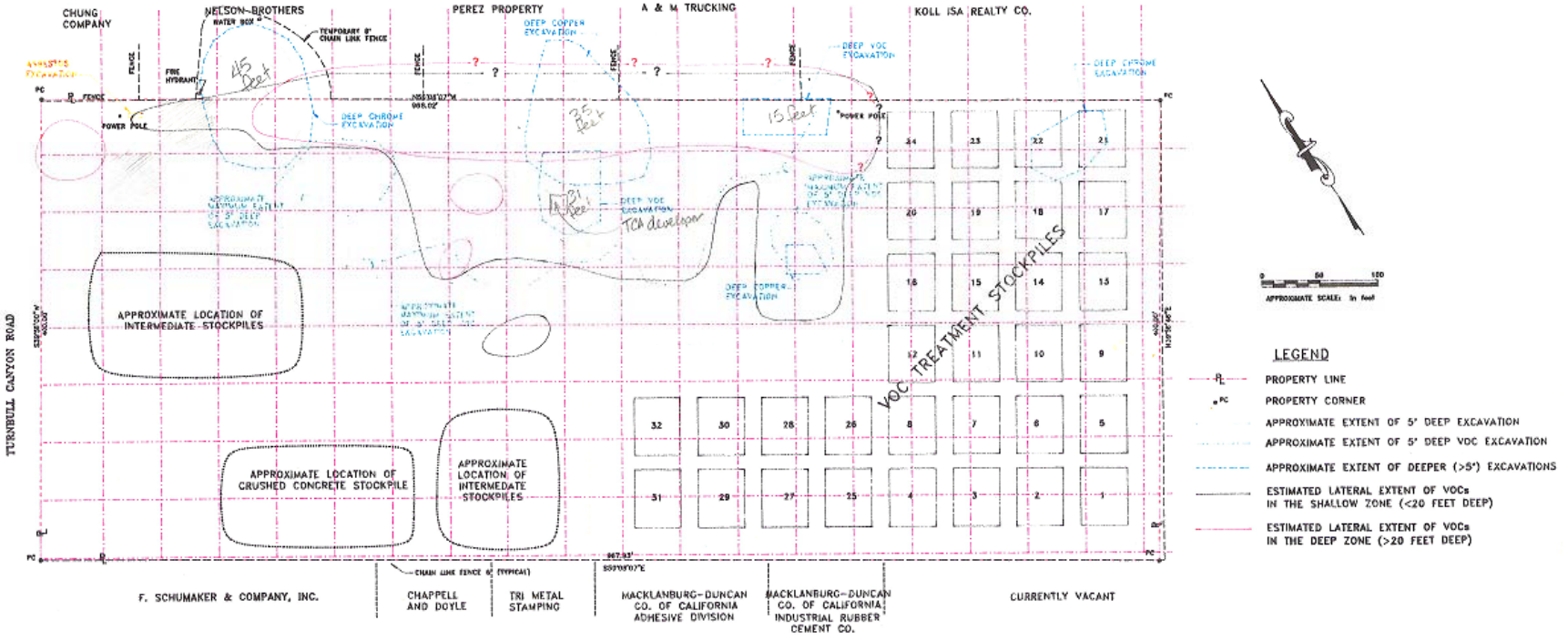


Site Remediation History

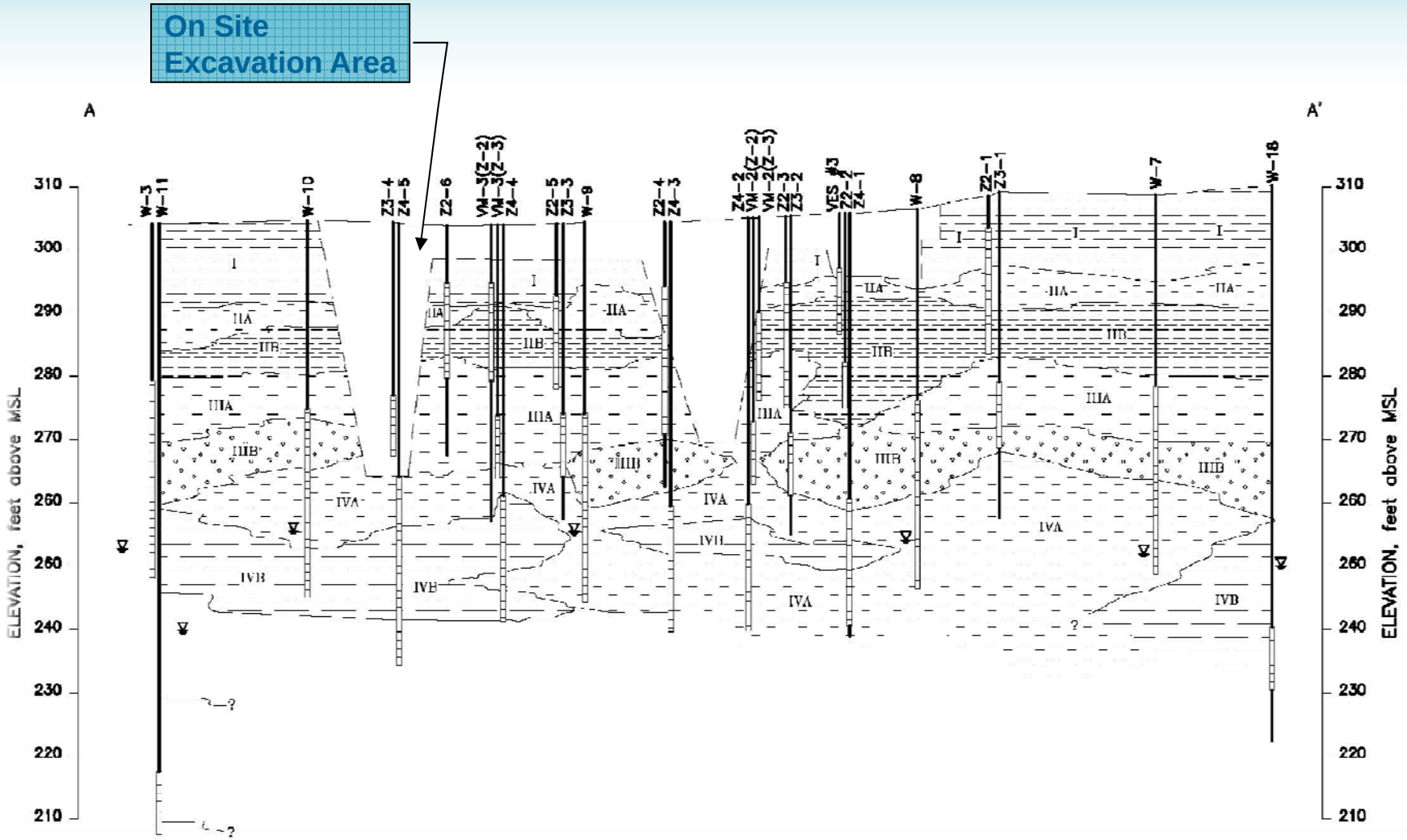
- 1987 to 1990 – Site investigation activities
  - 75 soil gas probes, 100 soil borings, and 16 groundwater wells
- 1990 to 1992 – Onsite buildings demolished and highest impacted soils excavated from 5 to 45 feet below grade
  - 2,900 cubic yards (CY) of chromium-impacted and 3,700 CY of copper-impacted soil excavated for offsite disposal
  - 14,000 CY of VOC-impacted soil excavated and treated on site for backfill and site redevelopment (4.5 months of SVE; 427 lbs removed)
- 1992 to 2007 – In situ soil remediation (SVE)
  - 34 vapor extraction wells connected to blowers capable of extracting approximately 800 cubic feet per minute
  - RWQCB soil closure in September 1998; continued operation to remove mass exposed during varying water table
  - Removed approximately 9,196 lbs of VOCs
- 1996 to 2004 – Groundwater extraction and treatment system
  - 10 extraction wells; removed approx. 40 million gallons of groundwater and 428 lbs of VOCs (2004 to 2008 operation was intermittent)

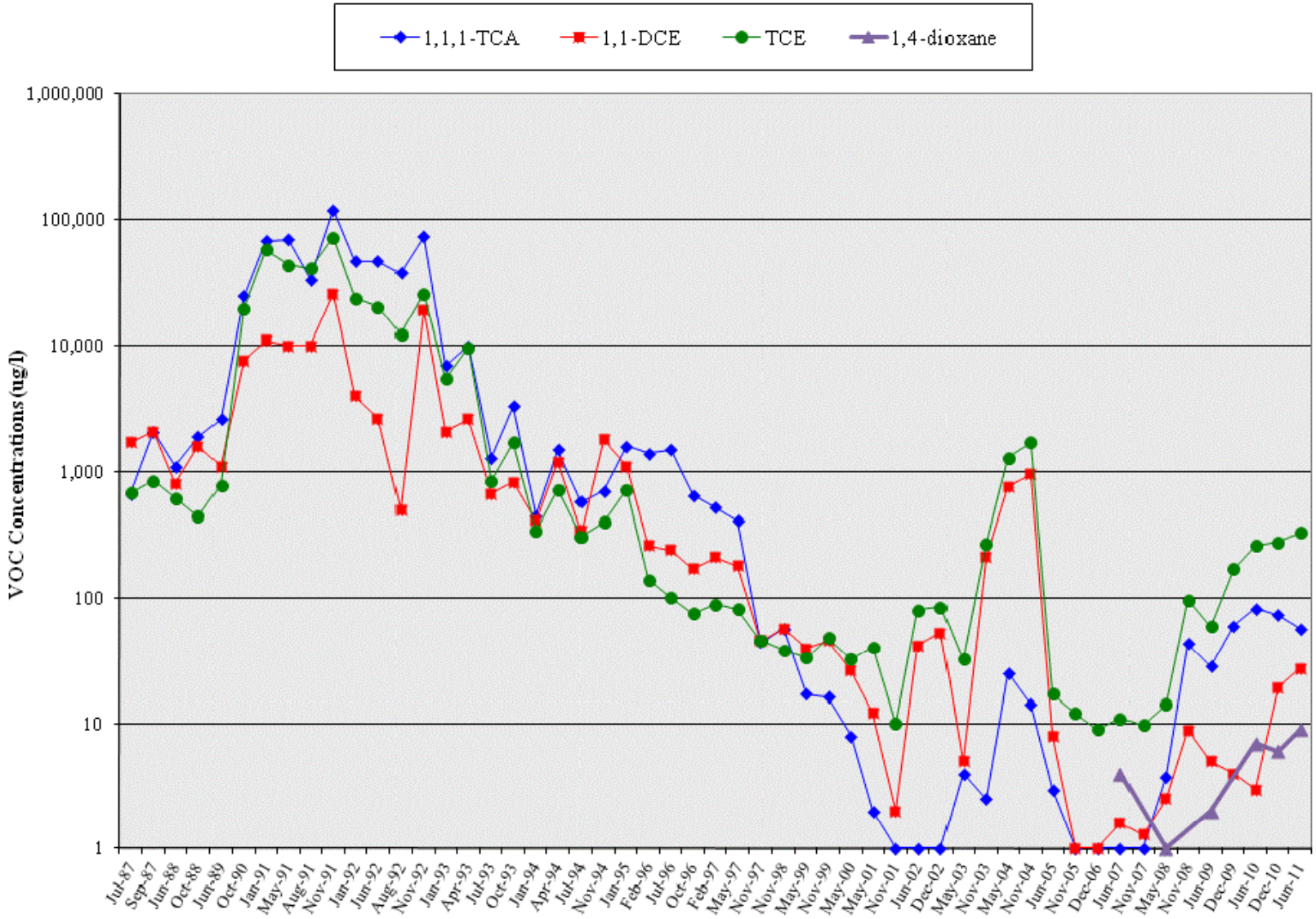
Source Area Remediation

Soil Excavations

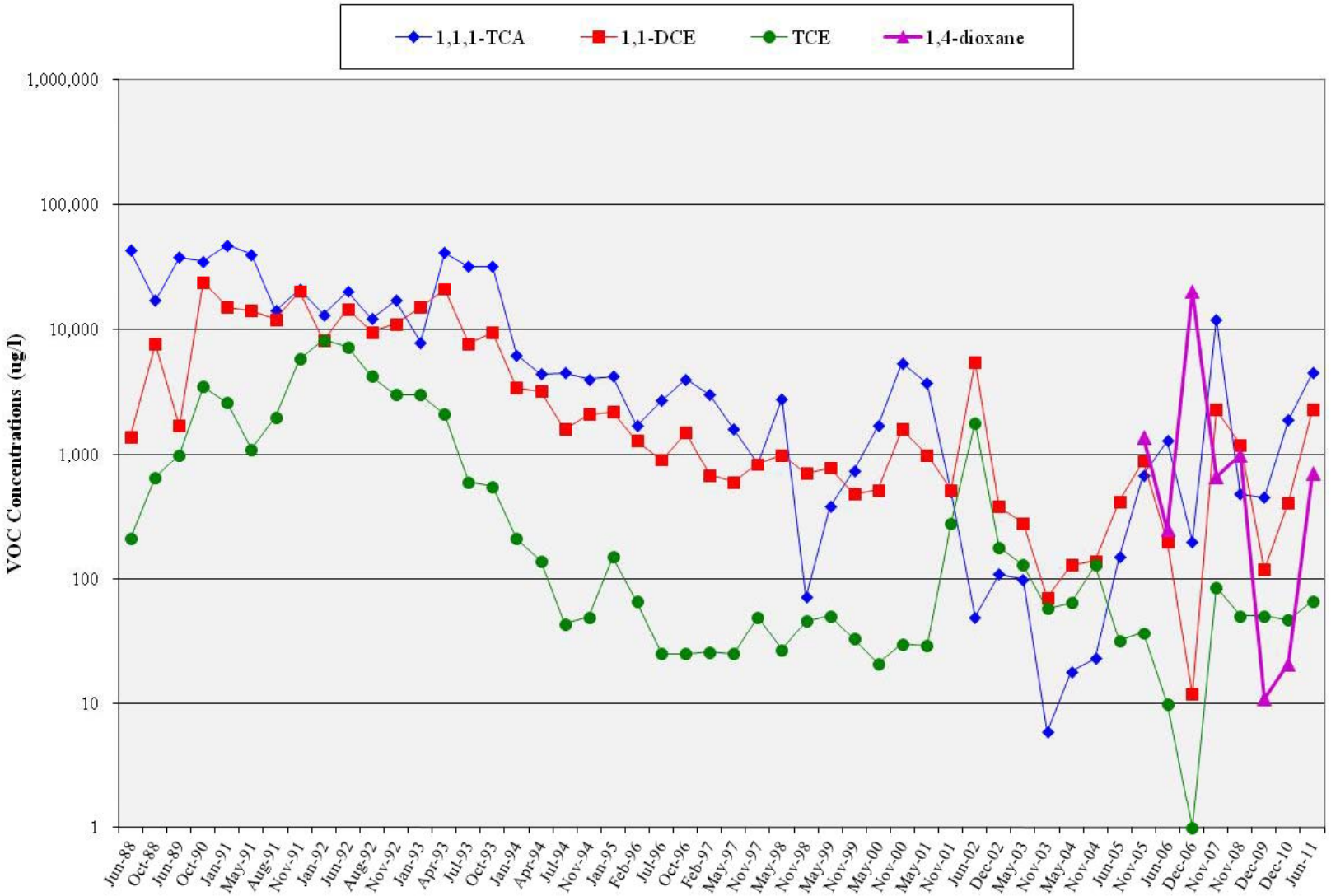


Vadose Zone Section (Excavations and SVE System)



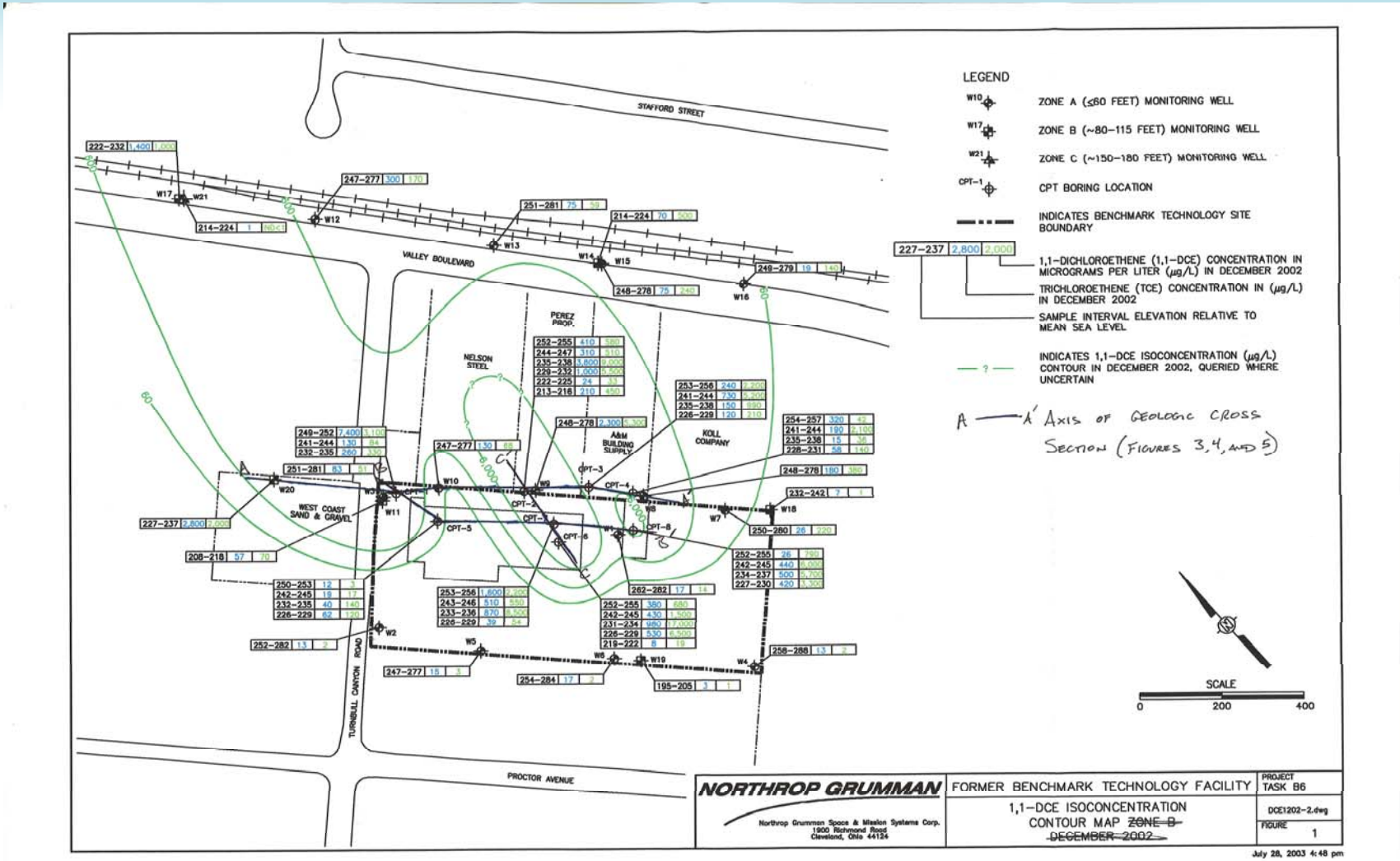


NORTHROP GRUMMAN	Former TRW Benchmark Site, City of Industry, CA	Project: BEN.06.11.037
	VOC Concentrations vs. Time - Well W3	**FIGURE 8**



NORTHROP GRUMMAN	Former TRW Benchmark Site, City of Industry, CA	Project: BEN.06.11.037
	VOC Concentrations vs. Time - Well W8	**FIGURE 9**

Deep Source Area Investigation



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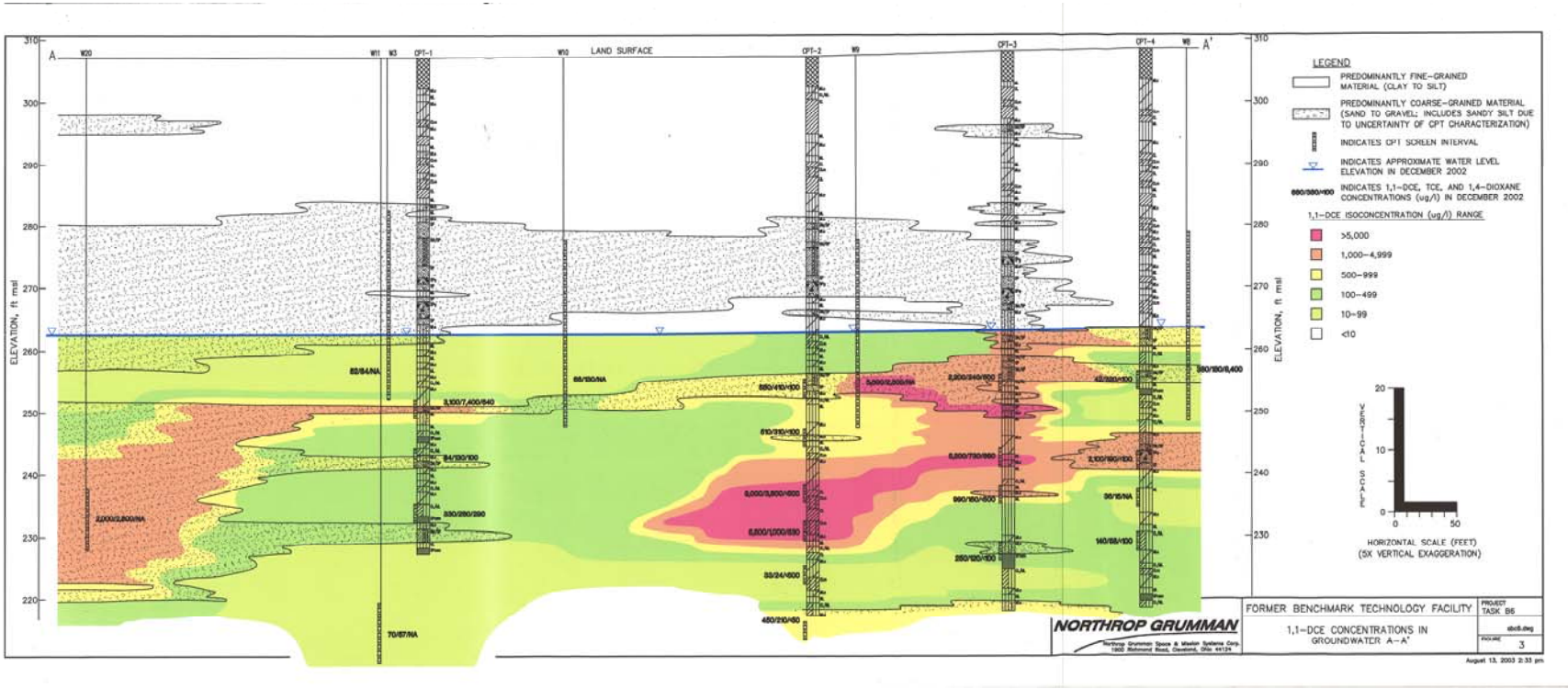
Deep Source Area Investigation



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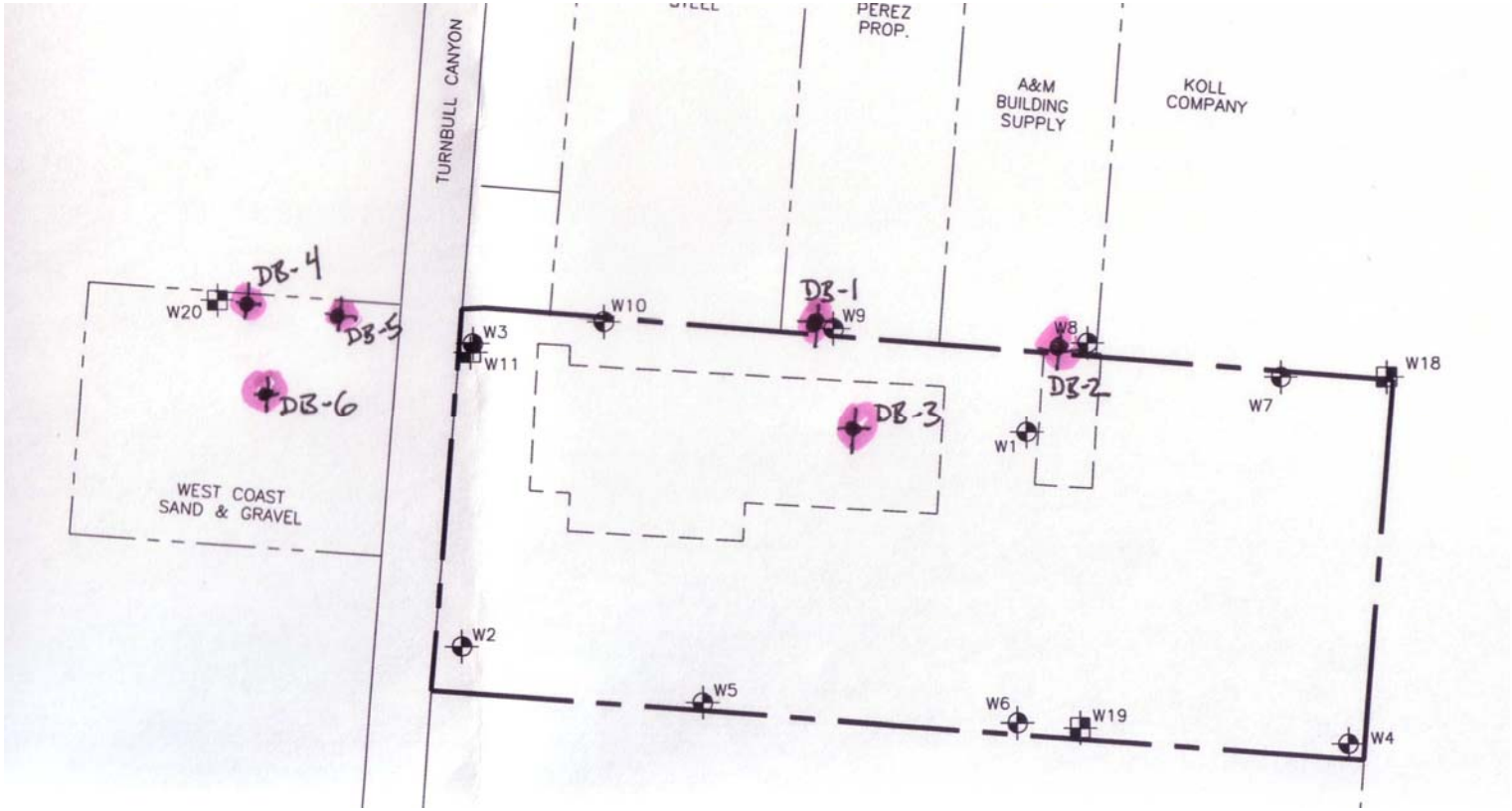
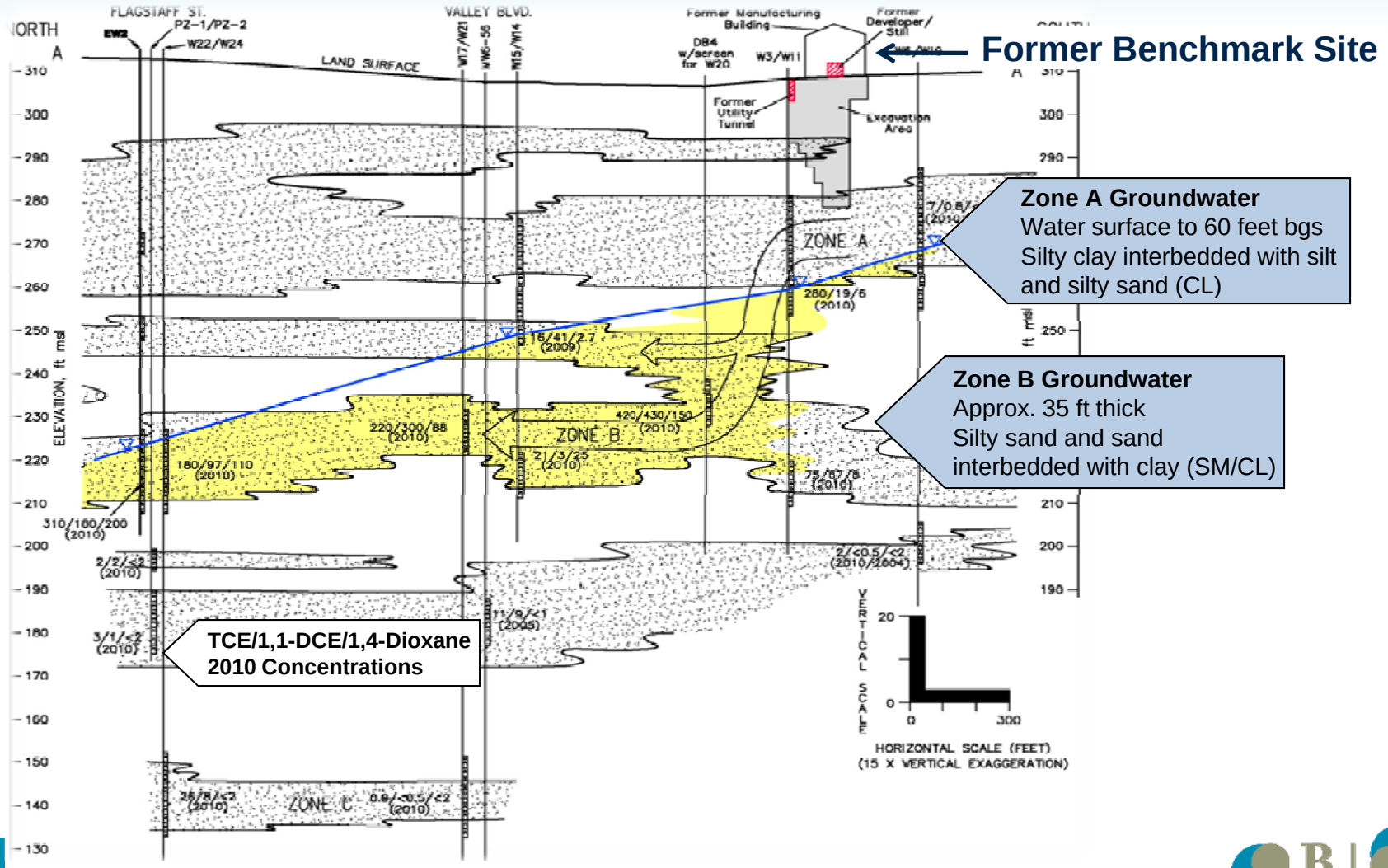
W20 Soil Profile Investigation (2004)



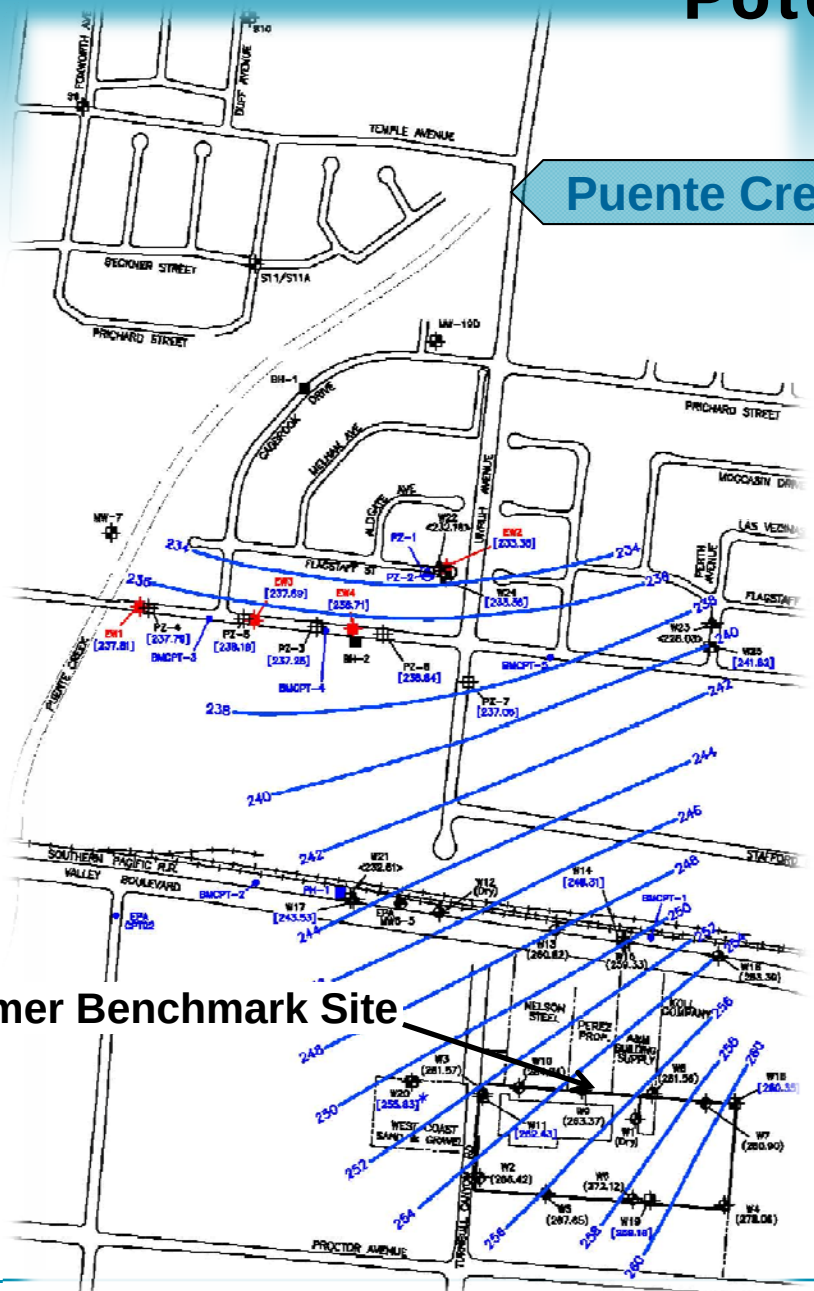
table

W20 / Acorn Engineering

Generalized Geologic Cross Section

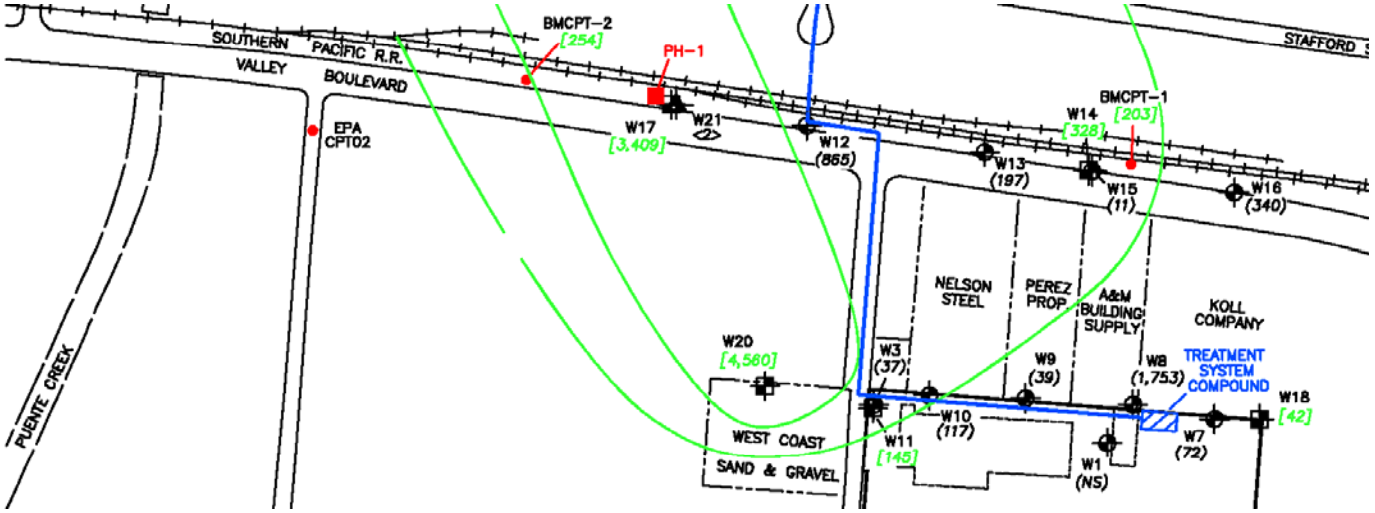


Potentiometric Surface Map
Zone B – June 2011



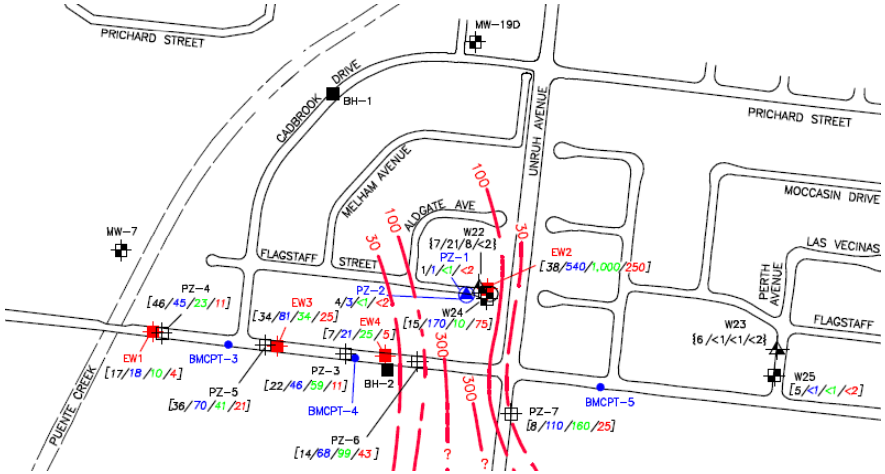
Valley Boulevard Investigation (2005)

- Drilled borings to confirm lithology and design extraction wells
- Verified extent of Benchmark plume along Valley Blvd
- Performed short-duration well yield tests and determined that wells along Valley Blvd. screened in impacted interval were not capable of sustaining GW extraction system (less than 5 gpm)



Vertical Assessment on Flagstaff (2006)

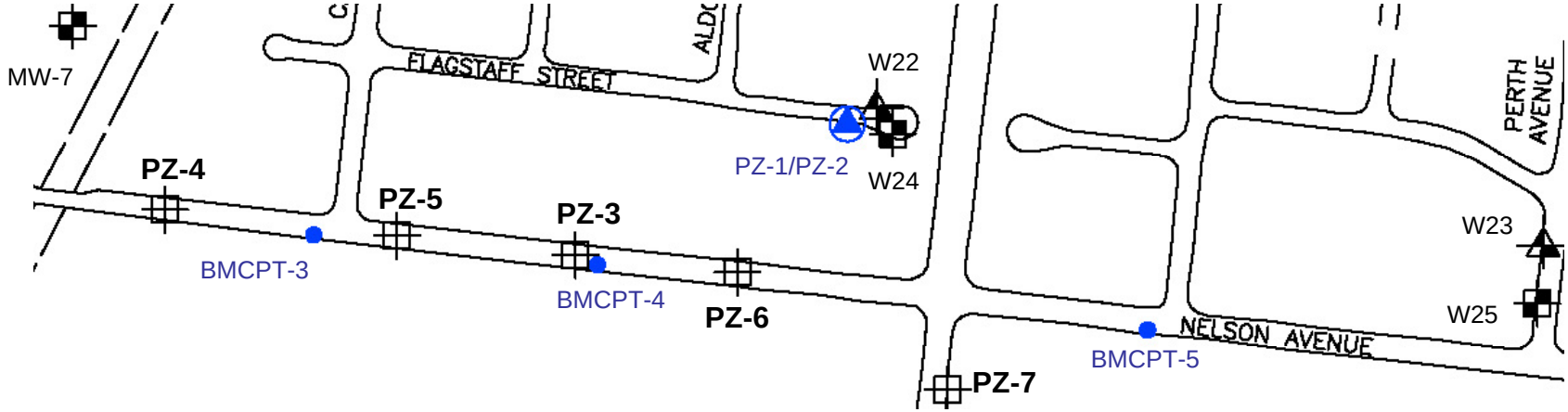
- Installed piezometers PZ-1 and PZ-2 in Flagstaff adjacent to wells W22 and W24 to delineate vertical impacts



Well	Screen Interval (feet)	TCE (ppb)	1,1-DCE (ppb)	1,4-Dioxane (ppb)
W24	85 to 105	250	400	110
PZ-1	116 to 121	1.9	1.7	ND<2
PZ-2	125 to 140	3.8	0.5	ND<2
W22	160 to 180	7.1	2.2	ND<2

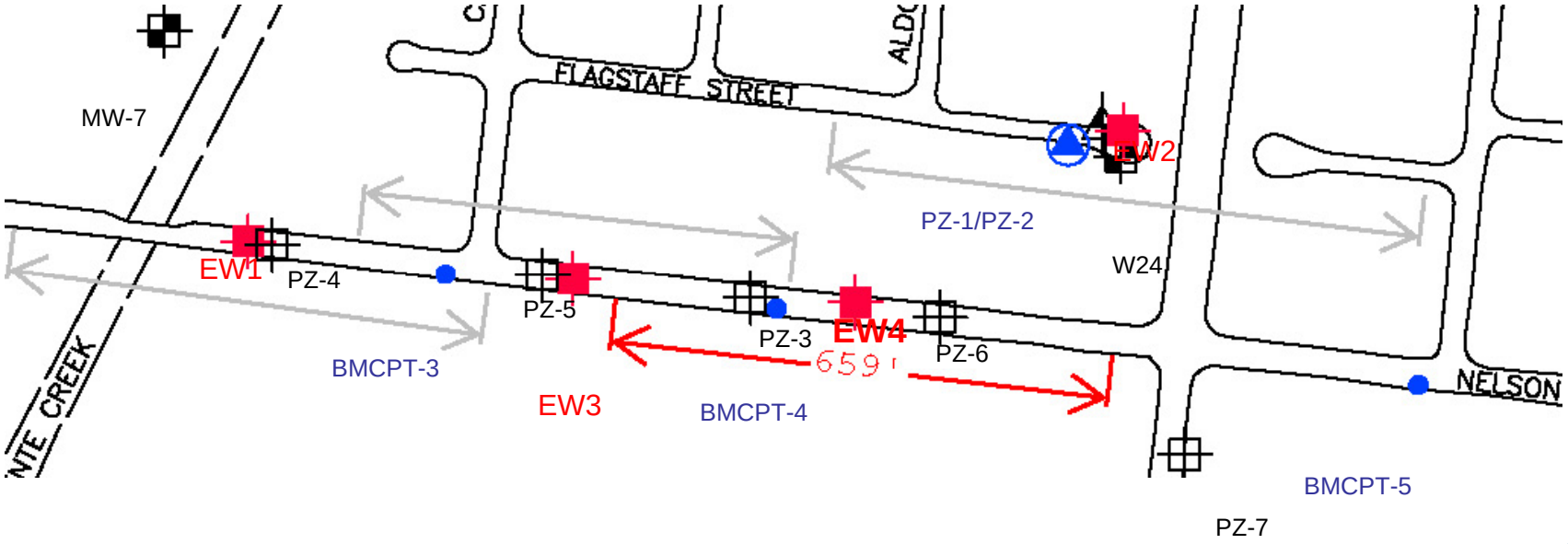
Nelson Ave. Investigation (2006)

Well / Boring	Sample Date	PCE (µg/l)	TCE (µg/l)	1,1,1-TCA (µg/l)	1,1-DCE (µg/l)	cis-1,2-DCE (µg/l)	trans-1,2-DCE (µg/l)	Vinyl Chloride (µg/l)	1,1-DCA (µg/l)	1,4-Dioxane (µg/l)
EPA MW-7	5/10/2006	85	120	ND<5	100	25	ND<5	ND<5	9	9
PZ-4	7/6/2006	43	24	ND<0.5	9	8	ND<0.5	ND<1	1	NA
BMCPT-3	3/27/2006	18	36	ND<0.5	36	13	ND<0.5	ND<1	5	15
PZ-5	7/21/2006	64	67	ND<0.5	55	13	ND<0.5	ND<0.5	4	16
PZ-3	6/8/2006	14	44	ND<0.5	50	3	ND<0.5	ND<0.5	4	28
BMCPT-4	3/27/2006	15	230	1	540	32	1	ND<1	74	200
PZ-6	7/21/2006	30	130	2	160	11	ND<0.5	ND<0.5	17	46
W24	12/13/2006	16	250	ND<2.5	430	8.2	ND<2.5	ND<5	36	110
PZ-7	7/21/2006	11	190	ND<0.5	360	4	ND<0.5	ND<0.5	17	59
BMCPT-5	3/28/2006	1	5	ND<0.5	8	ND<0.5	ND<0.5	ND<1	1	ND<3.5
W25	6/8/2006	12	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2

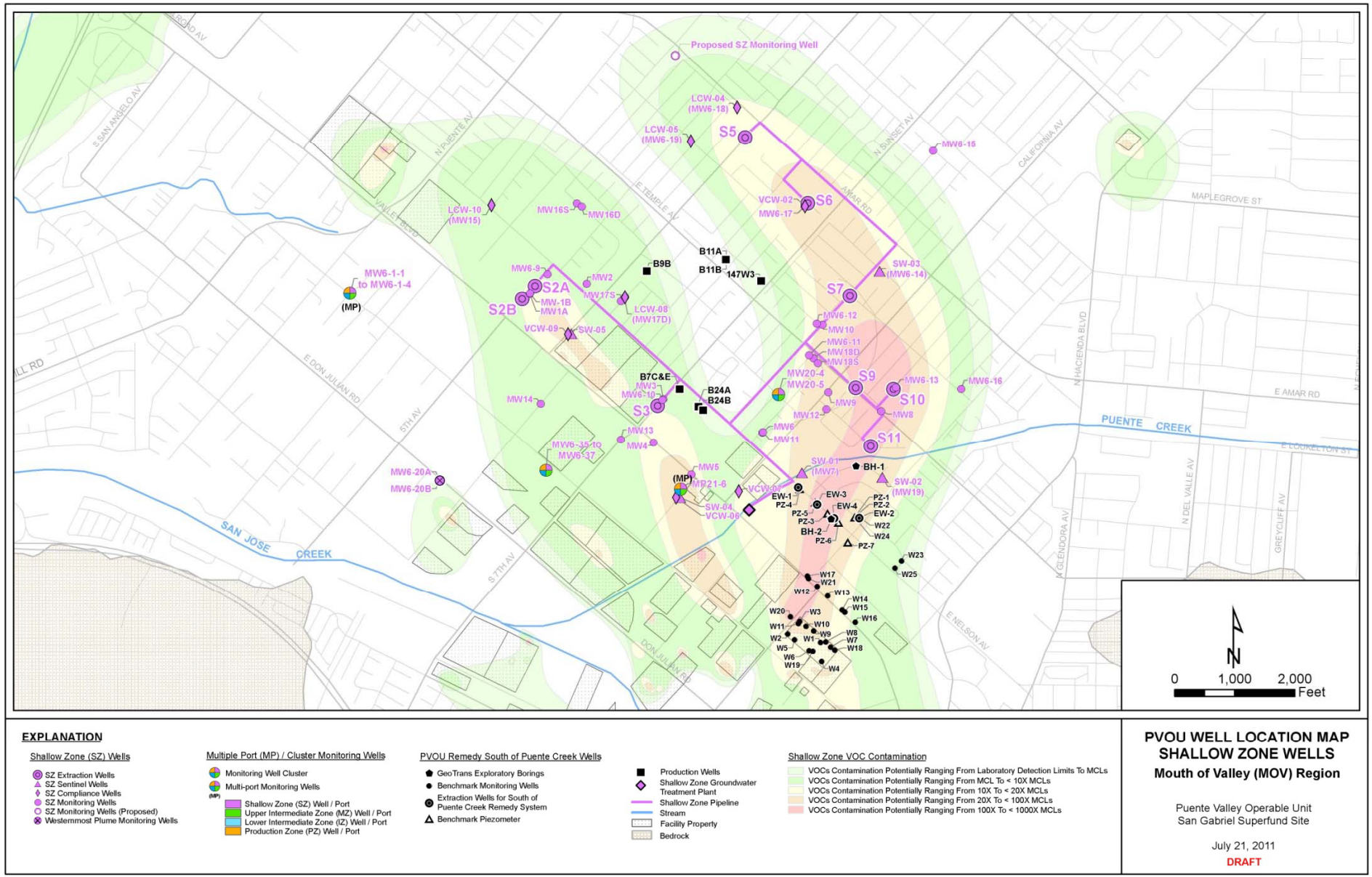


Extraction Well Installation

- Step-drawdown Tests
  - EW1 – 60 gpm
  - EW2 – 80 gpm
  - EW3 – 40 gpm
  - EW4 – 20 gpm



SZ CVOCs



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SHALLOW ZONE WELLS
Mouth of Valley (MOV) Region

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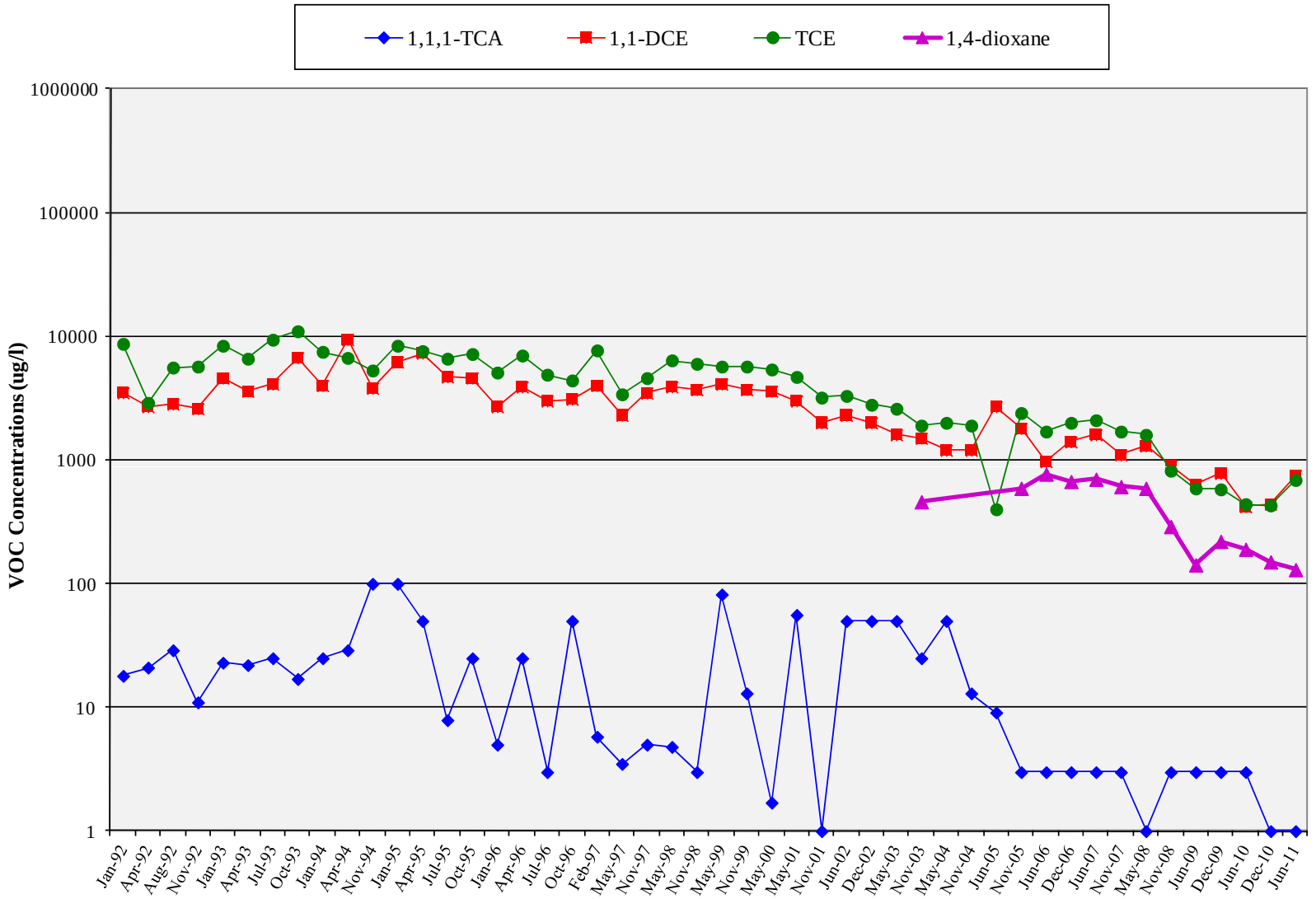
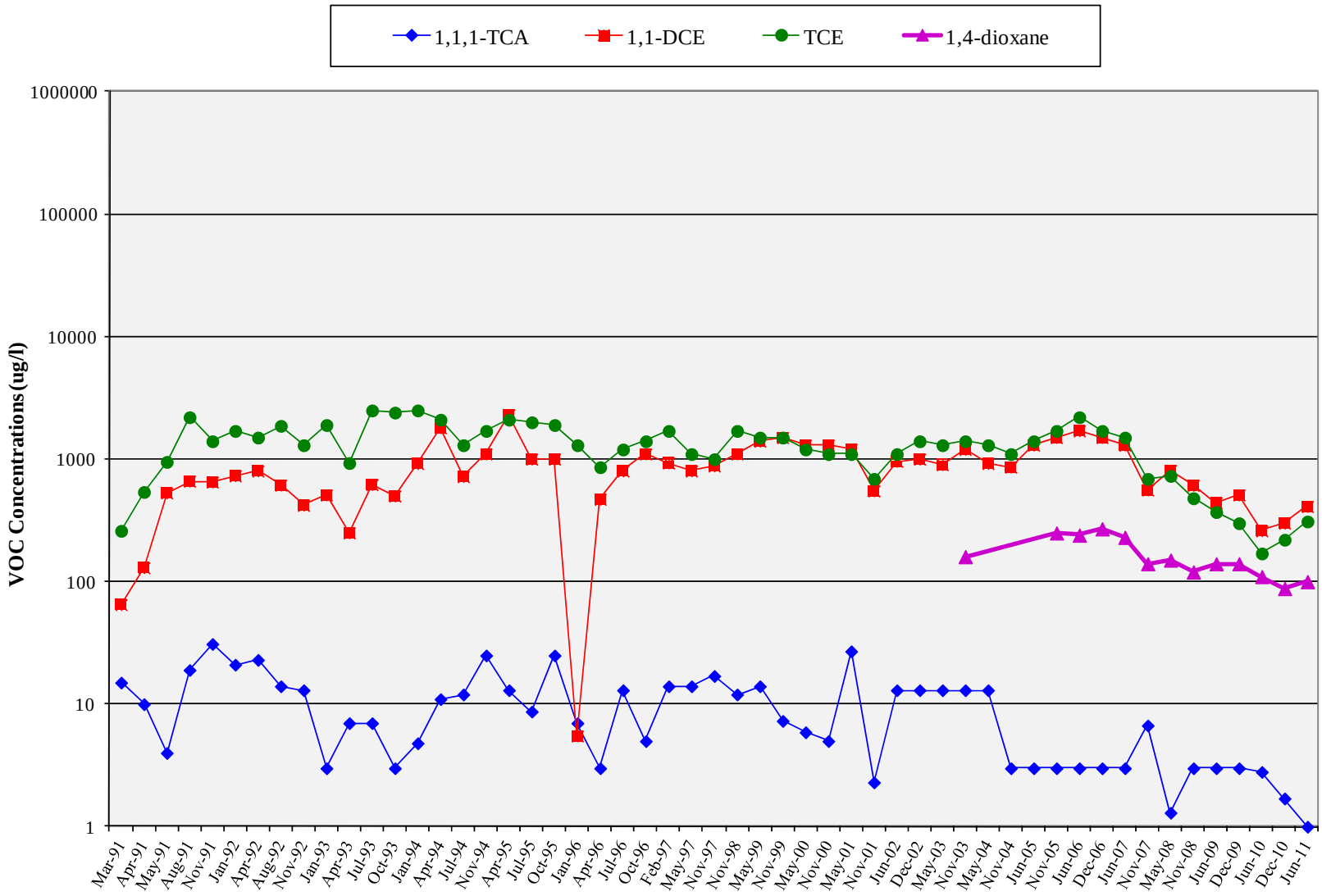
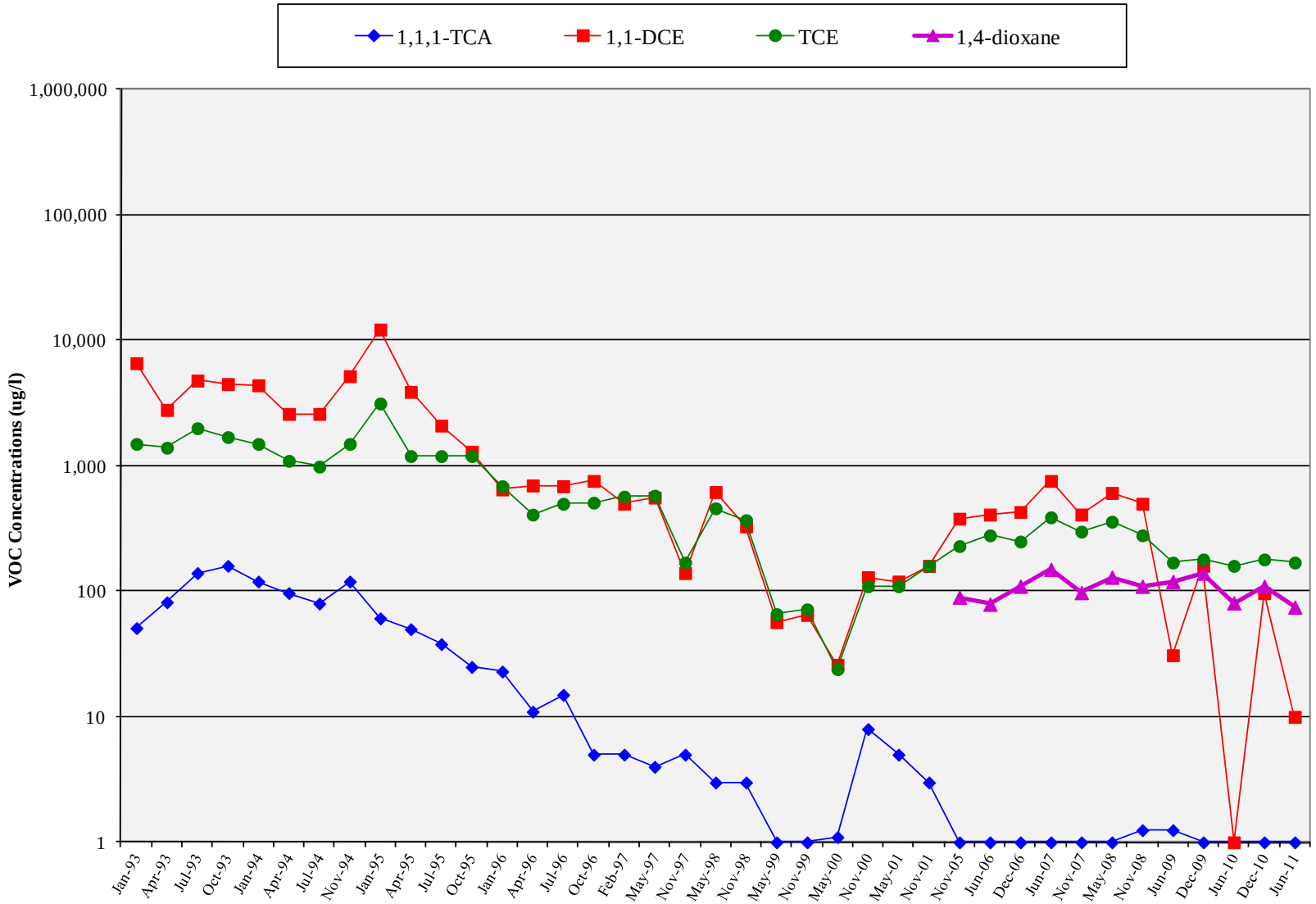


NORTHROP GRUMMAN	Former TRW Benchmark Site, City of Industry, CA	Project: BEN.06.11.037
	VOC Concentrations vs. Time - Well 20	**FIGURE 14**



NORTHROP GRUMMAN	Former TRW Benchmark Site, City of Industry, CA	Project: BEN.06.11.037
	VOC Concentrations vs. Time - Well W17	**FIGURE 13**



NORTHROP GRUMMAN	Former TRW Benchmark Site, City of Industry, CA	Project: BEN.06.11.037
	VOC Concentrations vs. Time - Well W24	**FIGURE 15**

Remedial Design Investigation (RDI)

Objectives

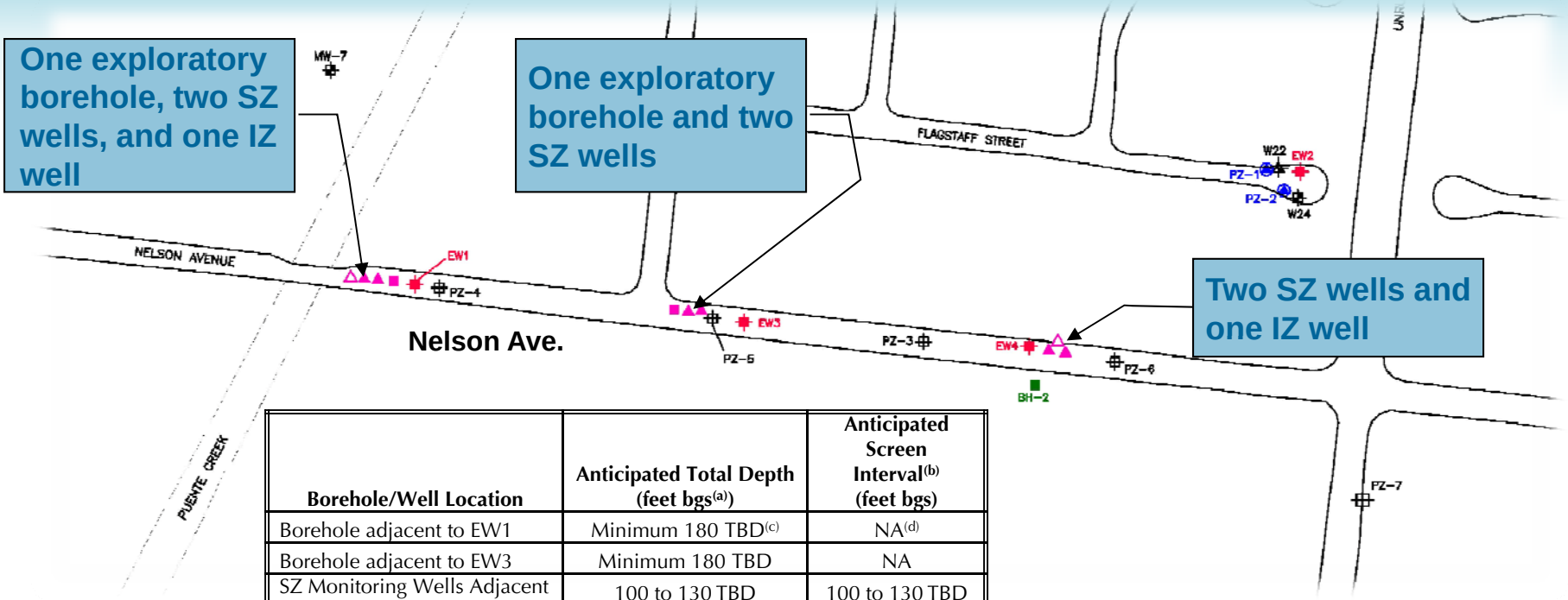
- Evaluate whether VOCs originating from the Benchmark site are migrating at depths below the screened intervals of the Nelson Avenue extraction wells
- Collect data necessary to design and implement an extraction well network capable of providing hydraulic containment of this deeper impacted groundwater
- Install additional extraction wells (if necessary).

RDI Borehole and Well Locations

One exploratory borehole, two SZ wells, and one IZ well

One exploratory borehole and two SZ wells

Two SZ wells and one IZ well



Borehole/Well Location	Anticipated Total Depth (feet bgs[a])	Anticipated Screen Interval[b] (feet bgs)
Borehole adjacent to EW1	Minimum 180 TBD[c]	NA[d]
Borehole adjacent to EW3	Minimum 180 TBD	NA
SZ Monitoring Wells Adjacent to EW1	100 to 130 TBD	100 to 130 TBD
	130 to 150 TBD	130 to 150 TBD
Upper IZ Monitoring Well Adjacent to EW1	Minimum 180 TBD	TBD
SZ Monitoring Wells Adjacent to EW3	100 to 130 TBD	100 to 130 TBD
	130 to 150 TBD	130 to 150 TBD
SZ Monitoring Wells Adjacent to UTC Boring BH-2	123	103 to 123
	152	132 to 152
Upper IZ Monitoring Well Adjacent to UTC Boring BH-2	185	165 to 185

(a) bgs - Below ground surface.
(b) Each screen interval is anticipated to be 10 to 20 feet.
(c) TBD - To be determined
(d) NA - Not applicable

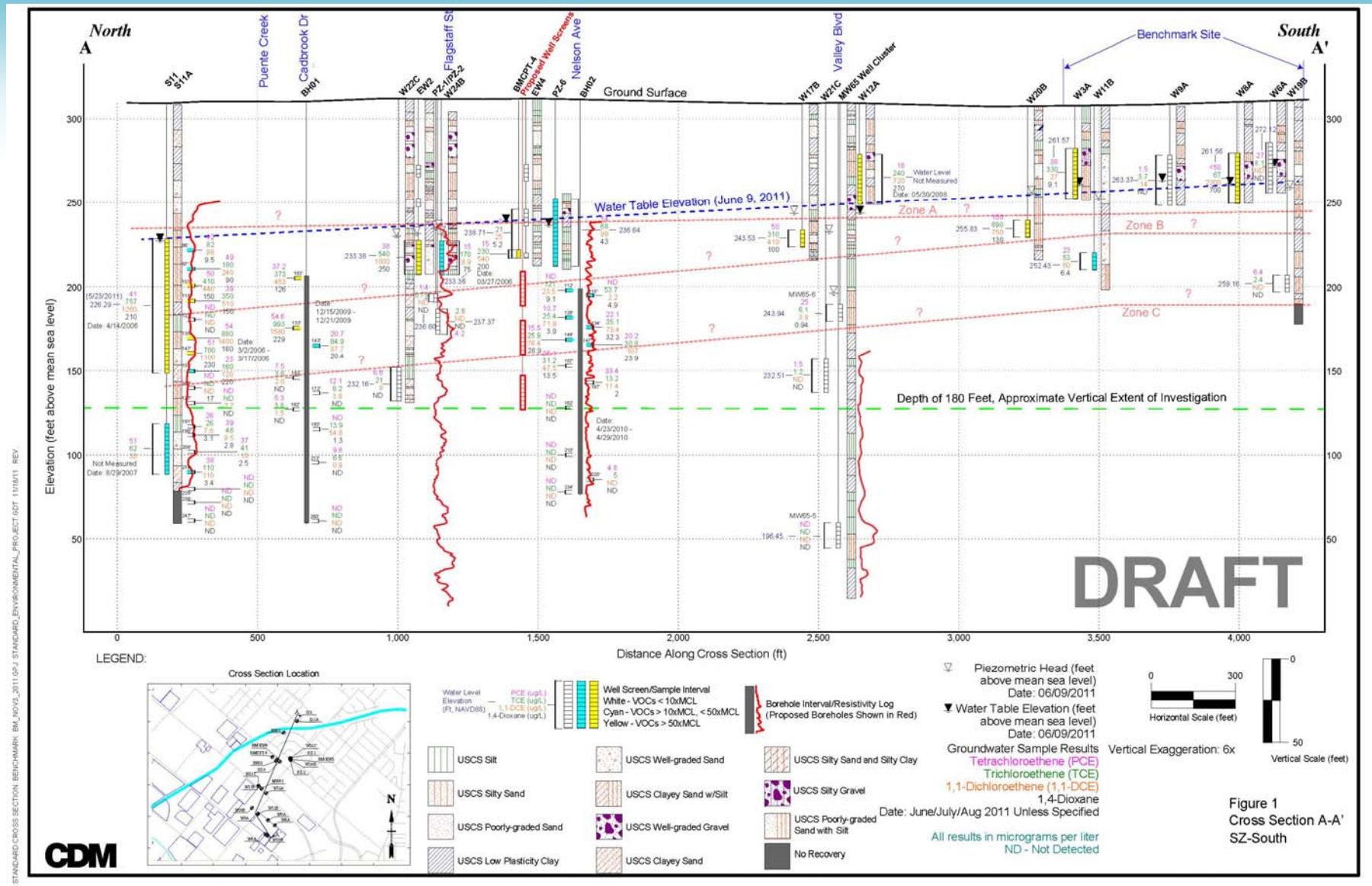


Figure 1
Cross Section A-A'
SZ-South

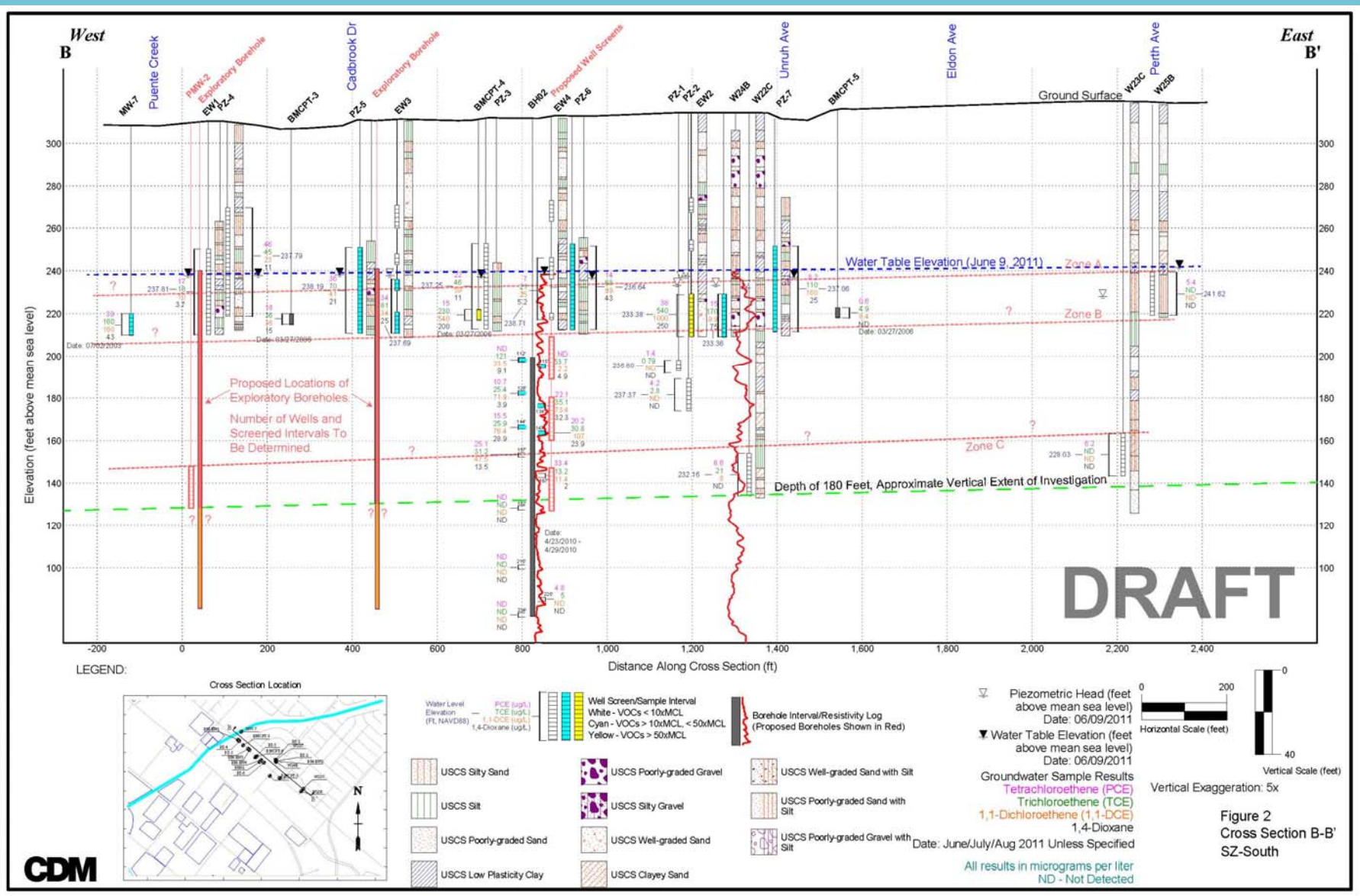


Figure 2
Cross Section B-B'
SZ-South

END